What is claimed is:

1. A robotic cart pulling vehicle comprising:

at least two axially collinear drive wheels;

a robot body mounted on said drive wheels;

a control system on the robot body utilizing, at least in part, a ded-reckoning navigational system;

a cart attaching mechanism on said robot body for coupling a cart to said robotic vehicle; wherein the improvement comprises

a positioning error reducing system for reducing accumulated error in the ded-reckoning navigational system, said positioning error reducing system including at least one of

i) a load transfer point of the cart attaching mechanism positioned at a height from the ground that is below a height that is selected from at least one of (a) approximately 1/5 of the wheel base of said drive wheels, and (b) a height of the axles of the drive wheels;

ii) a floor variation compliance structure, wherein the cart attaching mechanism includes a cart attaching bore in the robot body and a cart attaching post within the cart attaching bore, wherein each said drive wheel is mounted to said robot body in a manner allowing vertical movement of said wheel relative to the cart attaching post in the amount of at least three degrees measured from a center point of the collinear drive wheel axles, whereby said collinear drive wheels maintain a substantially even distribution of load over minor surface variations;

iii) minimal wheel contact surface structure, wherein each said drive wheel includes an annular contact surface formed as a coating over a solid, stiff core and includes at least one of (a) under load, compression of the wheel is less than 2% of the wheel radius, (b) the width of the annular contact surface is less than 1.5% of the wheelbase, (c) the width of the annular contact patch is on the

order of 0.20", and (d) the variation of the wheel base in operation is less than 2%;

iv) calibration structure, wherein at least one proximity sensor mounted on the robot body, said control system coupled to said at least one proximity sensor for adjusting the calculated robotic position, wherein the control system sets up virtual checkpoints along known fixed features of a predetermined length, takes a statistically significant number of proximity readings along an adjacent fixed feature, removes statistically anomalous readings and automatically adjusts the robotic position based upon statistically significant readings; and

v) both an electrical and mechanical connection between the cart and the robotic vehicle formed with a cart attaching post positioned at a midpoint of the wheel base, wherein the cart attaching post is part of the cart attaching mechanism.

2. The robotic cart pulling vehicle of claim 1 wherein the positioning error reducing system includes the calibration system having at least one proximity sensor mounted on the robot body, said control system coupled to said at least one proximity sensor for adjusting the calculated robotic position, wherein the control system sets up virtual checkpoints along known fixed features of a predetermined length, takes a statistically significant number of proximity readings along an adjacent fixed feature, removes statistically anomalous readings and automatically adjusts the robotic position based upon statistically significant readings.

3. The robotic cart pulling vehicle of claim 2 wherein each said proximity sensor is an infrared range sensor.

4. The robotic cart pulling vehicle of claim 2 wherein at least one fixed feature is a straight wall section of at least 2' in length.

5. The robotic cart pulling vehicle of claim 2 wherein each said fixed feature is a straight wall section of at least the predetermined length.

6. The robotic cart pulling vehicle of claim 2 wherein said statistically significant number of proximity readings taken along an adjacent fixed feature are obtained by the control system at about 16 times a second as the robotic vehicle moves along the adjacent fixed feature.

7. The robotic cart pulling vehicle of claim 2 wherein the positioning error reducing system includes a load transfer point of the cart attaching mechanism, that is in the form of a load transfer ring positioned at a height from the ground that is below a height that is selected from at least one of (a) approximately 1/5 of the wheel base of said drive wheels, and (b) a height of the axles of the drive wheels.

8. The robotic cart pulling vehicle of claim 7 wherein the load transfer ring is positioned at a height below a height that is approximately 1/10 of the wheel base.

9. The robotic cart pulling vehicle of claim 7 wherein the load transfer ring is positioned at a height below the axles of the drive wheels.

10. The robotic cart pulling vehicle of claim 7 wherein the positioning error reducing system includes a minimal wheel contact surface structure, wherein each said drive wheel includes an annular contact surface formed as a coating over a solid, stiff core and includes at least one of (a) under load, compression of the wheel is less than 2% of the wheel radius, and (b) the width of the annular contact surface is less than 1.5% of the wheelbase.

11. The robotic cart pulling vehicle of claim 10 wherein the positioning error reducing system includes a minimal wheel contact surface structure, wherein each said drive wheel includes an annular contact surface formed as a coating over a solid, stiff core and includes at least one of (a) under

load, compression of the wheel is less than 1.0% of the wheel radius, and (b) the width of the annular contact surface is less than 1.0% of the wheelbase.

12. The robotic cart pulling vehicle of claim 10 wherein the positioning error reducing system includes a floor variation compliance structure, wherein the cart attaching mechanism includes a cart attaching bore in the robot body and a cart attaching post within the cart attaching bore, wherein each said drive wheel is mounted to said robot body in a manner allowing vertical movement of said wheel relative to the cart attaching post in the amount of at least three degrees measured from a center point of the collinear drive wheel axles, whereby said collinear drive wheels maintain a substantially even distribution of load over minor surface variations.

13. The robotic cart pulling vehicle of claim 2 wherein the positioning error reducing system includes a minimal wheel contact surface structure, wherein each said drive wheel includes an annular contact surface formed as a coating over a solid, stiff core and includes at least one of (a) under load, compression of the wheel is less than 1.0% of the wheel radius, and (b) the width of the annular contact surface is less than 1.0% of the wheelbase.

14. The robotic cart pulling vehicle of claim 2 wherein the positioning error reducing system includes a floor variation compliance structure, wherein the cart attaching mechanism includes a cart attaching bore in the robot body and a cart attaching post within the cart attaching bore, wherein each said drive wheel is mounted to said robot body in a manner allowing vertical movement of said wheel relative to the cart attaching post in the amount of at least three degrees measured from a center point of the collinear drive wheel axles, whereby said collinear drive wheels maintain a substantially even distribution of load over minor surface variations.

15. The robotic cart pulling vehicle of claim 1 wherein the positioning error reducing system includes a minimal wheel contact surface structure, wherein each said drive wheel includes an annular contact surface formed as a coating over a solid, stiff core and includes at least one of (a) under load, compression of

the wheel is less than 2% of the wheel radius, (b) the width of the annular contact surface is less than 1.5% of the wheelbase, and (c) the width of the annular contact patch is on the order of 0.20".

16. The robotic cart pulling vehicle of claim 15 wherein the positioning error reducing system includes a floor variation compliance structure, wherein the cart attaching mechanism includes a cart attaching bore in the robot body and a cart attaching post within the cart attaching bore, wherein each said drive wheel is mounted to said robot body in a manner allowing vertical movement of said wheel relative to the cart attaching post in the amount of at least three degrees measured from a center point of the collinear drive wheel axles, whereby said collinear drive wheels maintain a substantially even distribution of load over minor surface variations.

17. The robotic cart pulling vehicle of claim 15 wherein the positioning error reducing system includes a minimal wheel contact surface structure, wherein each said drive wheel includes an annular contact surface formed as a coating over a solid, stiff core and includes at least one of (a) under load compression of the wheel is less than 1.0% of the wheel radius, and (b) the width of the annular contact surface is less than 1.0% of the wheelbase.

18. The robotic cart pulling vehicle of claim 1 wherein the positioning error reducing system includes a minimal wheel contact surface structure, wherein each said drive wheel includes an annular contact surface formed as a coating over a solid, stiff core and includes at least one of (a) under load compression of the wheel is less than 1.0% of the wheel radius, and (b) the width of the annular contact surface is less than 1.0% of the wheelbase.

19. The robotic cart pulling vehicle of claim 1 wherein the cart attaching mechanism includes a cart attaching bore in the robot body and a cart attaching post within the cart attaching bore, wherein the cart attaching post provides both a mechanical and an electrical connection between the cart and the robot vehicle.

20. The robotic cart pulling vehicle of claim 1 wherein the positioning error reducing system includes a floor variation compliance structure, wherein the cart attaching mechanism includes a cart attaching bore in the robot body and a cart attaching post within the cart attaching bore, wherein each said drive wheel is mounted to said robot body in a manner allowing vertical movement of said wheel relative to the cart attaching pole in the amount of at least three degrees measured from a center point of the collinear drive wheel axles, whereby said collinear drive wheels maintain a substantially even distribution of load over minor surface variations.